PROPOSED REVISIONS TO CIRCULAR DEQ 4 2002 EDITION

Proposed Language Revision:

CHAPTER 4
SITE MODIFICATIONS

4.3.3.2 ~~Fill must be of suitable depth to provide the minimum separation distances from the finished ground surface to a limiting layer.~~ Fill may be used in areas where there is adequate separation distance from the ground surface to a limiting layer. Fill cannot be used to overcome minimum vertical or horizontal separation distances.

Reason for Revision:

The current language in 4.3.3.2 is contradictory. The original intent of this section was to disallow the use of fill for the purpose of meeting the minimum separation distance to a limiting layer. The first sentence suggests the contrary, and is being replaced with language consistent with the original intent.

Proposed Language Revision:

CHAPTER 5
WASTEWATER FLOW

5.4 Wastewater strength

Subsurface wastewater disposal systems must be used only for residential strength wastewater. Wastewater exceeding the limits for residential strength wastewater must be pretreated to residential strength prior to discharging to DEQ-4 systems. Effluent from recreational vehicle holding tanks have BOD_5 levels as high as 15 times that of residential strength wastewater and must be pretreated accordingly. High strength waste must be pretreated with ~~recirculating sand filters and aerobic treatment units or other~~ systems specifically designed to reduce high strength wastewater to residential strength wastewater. For design, construction, operation and maintenance of systems that treat high strength wastewater, please refer to the Onsite Wastewater Treatment Systems Manual, EPA/625/R-00/008, February 2002.

Reason for Revision:

The current language in section 5.4 conflicts with language in section 16.1 for recirculating sand filters that states "The wastewater strength discharged to the sand filter must not exceed residential strength wastewater." The original intent of section 5.4 was to require the use of treatment systems specifically designed to pretreat high strength wastewater. The sand filter mentioned in this section is not the same type of sand filter described in Chapter 16. Therefore, the reference to sand filters and aerobic treatment units in this section is being eliminated to avoid confusion, and the reader is instead referred to EPA guidance.

Proposed Language Revision:

CHAPTER 6
DESIGN OF SEWERS

6.2.1 Only wastewater ~~must~~ may be placed into the sewer system. Rainwater from roofs, streets, and other areas, as well as ground water from foundation drains~~, and back flush water from water softeners~~ must be excluded. Also, see Chapters 7 and 8 for special conditions placed on water softeners and other water treatment devices.

CHAPTER 7
SEPTIC TANKS

7.1 General

All wastewater must discharge into the septic tank.

Roof, footing, garage, surface water drainage, ~~backwash water from water softeners,~~ and cooling water must be excluded.

The wastewater (backwash) from water softeners may be discharged to a wastewater treatment system if the installed water softener:

(A) conserves water by design;
(B) regenerates using a demand-initiated regeneration control device; and
(C) is only connected to interior plumbing and not to exterior irrigation water lines.

Wastewater from water treatment devices including water softeners, iron filters and reverse osmosis units may not be discharged into an aerobic, nonstandard (excluding elevated sand mounds, intermittent sand filters and recirculating sand filters), or proprietary on-site wastewater treatment system unless the quality and quantity of discharge meets the recommended usage, operation and maintenance specifications of the designer or manufacturer of the system. If such specifications are not available, then approval for the discharge must be obtained from the reviewing authority.

Wastewater from water treatment devices including water softeners, iron filters and reverse osmosis units may be discharged to a dry well, a separate drainfield with pipe or gravelless chambers or onto the ground if not prohibited by other regulations.

The septic tank must be located where it is readily accessible for inspection and maintenance.

CHAPTER 8
STANDARD ABSORPTION TRENCHES

8.1 General

The satisfactory operation of the wastewater treatment system is largely dependent upon proper site selection and the design and construction of absorption trenches.

All new and replacement drainfields that receive wastewater discharged from water treatment devices including water softeners, iron filters and reverse osmosis units must be designed to adequately dispose of the additional flow. The sizing of absorption systems is addressed in Section 8.4.2.

Discharge of wastewater from water softeners into absorption trenches in clay soils with shrink/swell properties could result in premature system failure. Area-specific information on potential adverse impacts should be obtained from local health officials before connecting water softener backwash lines to on-site wastewater treatment systems.

Reason for Revision:

The 2000 edition of Circular DEQ 4 allowed the discharge of water softener backwash into septic systems with a recommendation that the effluent should not be discharged to septic system drainfields in soils with clay that exhibit shrink/swell properties. During subdivision task force meetings on proposed revisions to the 2000 edition, several members expressed concerns that there were apparent links between failed septic systems and the use of water softeners. The circular was revised such that the 2002 edition prohibited the discharge of water softener backwash into septic systems. After publication, representatives of the water softener industry approached DEQ with concerns that such a prohibition was unsubstantiated, and that there was no clear evidence of detrimental impacts to septic systems from water softeners that were properly operated and maintained.

To address the water softener industry's concerns, a committee was formed that included members of the subdivision task force and industry representatives to discuss the issue and exchange information. Based on the information presented during the discussions, it became apparent that the evidence for prohibiting water softener backwash into septic systems was inconclusive. The main body of technical documentation presented to the committee indicated that there should not be problems with discharging backwash to septic systems. The DEQ also contacted state agencies across the country and found that, of the agencies that responded back to DEQ, most do not prohibit water softener backwash into septic systems. To determine if there were any problems with water softeners and septic systems occurring on a statewide level, DEQ surveyed sanitarians in 38 counties/regions in Montana. The results of that survey indicated that there were no documented septic system failures that could be directly attributed to water softener backwash or the discharge of backwash into soils that contained clay with shrink/swell properties. Many of the respondents, however, did indicate that there were probably cases of septic system failures that were caused by hydraulic overloading from improperly sized drainfields that received discharge from water softeners and reverse osmosis units.

The proposed revision to Circular DEQ 4 removes the prohibition against discharge of water softener backwash into septic systems, and imposes a set of conditions on the use of water softeners and other water treatment devices such as iron filters and reverse osmosis units. To minimize the amount of water softener backwash discharged to the septic system, the new language incorporates the use of a demand-initiated regeneration (DIR) control device and adds the requirement to treat only interior water. This is nearly identical to the solution developed by the state of Texas, which also had previously prohibited the discharge of backwash from water softeners and reverse osmosis units into septic systems. The state of Wisconsin has a similar DIR requirement.

The new circular language also addresses potential impacts to aerobic, nonstandard, and proprietary sanitary wastewater treatment systems by requiring that the discharge meet the specifications of the designer/manufacturer of the system. The issue of potential hydraulic overloading also is addressed by adding a requirement in Chapter 8 to accommodate the additional flow of backwash water in drainfield sizing. Lastly, the potential for problems with backwash in clay soils is addressed with a recommendation that septic system designers consult with local health officials to determine if area soils contain clay with shrink/swell properties that may lead to premature septic system failure.

The revised language concerning water softeners and other water treatment devices is intended to strike a balance between the need to impose protective measures for septic systems/water quality and the level of scientific information currently available to justify those protective measures statewide. As needed, each county also has the ability to impose more stringent requirements than those specified in Circular DEQ 4 so that they may tailor their wastewater treatment regulations to local/regional conditions.

Note: The replacement of the word "must" with "may" in Section 6.2.1 does not have a substantive effect. The intended limitation should be stated with "may" rather than "must".

Proposed Language Revision:

CHAPTER 8
STANDARD ABSORPTION TRENCHES

TABLE 8-1 (Residential)

Texture	Square feet for three bedroom (ft^2)	Estimated Perc rate (min/in)	Application rate (gpd/ft^2)
Gravelly sand or very coarse sands (a)	375	< 3 (a)	0.8(a)
Loamy sand, coarse sand	375	3 - < 6	0.8
Medium sand, sandy loam	500	6 - <10	0.6
Fine sandy loam, loam, silt loam	600	10 - <16	0.5
Very fine sand, sandy clay loam	750	16 - <31	0.4
Clay loam, silty clay loam	1000	31 - <51	0.3
Sandy clay, clay, or silty clay	1500(b)(c)	51 - <121	0.2
Clays, silts, silty clays (soil is reported throughout the soil profile) (USE EVTA BED)	2000(d)	= 121	0.15
Clays or silts, pan evaporation rates do not allow for EVTA use		= 121	NP

(a) If the soil for 3 feet below the infiltrative surface ~~contains more than 15 percent gravel~~ is gravelly sand or very coarse sands, or there is less than 6 feet separation between the bottom of the trench and a limiting layer, the trench must be ~~sand-lined and~~ pressured-dosed or other treatment provided as approved by the reviewing authority. If the soil for 3 feet below the infiltrative layer is very gravelly sand or coarser textured, the trench also must be sand-lined or other treatment as approved by the reviewing authority.

(b) Pressure distribution will be required if more than 500 lineal feet (or 1000 square feet) of distribution line is needed.

(c) Comparison of soils profile report, percolation rate, and USDA soils report will be used to select applicable square footage.

(d) Square footage is increased because the trench sidewall is not available in EVTA bed systems.

NP – Not permitted

TABLE 8-2 (Nonresidential Facilities)

Texture	Square feet for 100 gpd (ft^2)	Estimated Perc rate (min/in)	Application rate (gpd/ft^2)
Gravelly sand or very coarse sands (a)	125	< 3 (a)	0.8 (a)
Loamy sand, coarse sand	125	3 - < 6	0.8
Medium sand, sandy loam	167	6 - <10	0.6
Fine sandy loam, loam, silt loams	200	10 - <16	0.5
Very fine sand, sandy clay loam	250	16 -<31	0.4
Clay loam, silty clay loam	333	31 - <51	0.3
Sandy clay, clay or silty clay	500(b)(c)	51 - < 121	0.2
Clays, silts, silty clays (soil is reported throughout the soil profile) (USE EVTA BED)	667 (d)	= 121	0.15
Clays or silts, pan evaporation rates do not allow for EVTA use	NP	= 121	NP

(a) If the soil for 3 feet below the infiltrative surface ~~contains more than 15 percent gravel~~ is gravelly sand or very coarse sands, or there is less than 6 feet separation between the bottom of the trench and a limiting layer, the trench must be ~~sand-lined and~~ pressured-dosed or other treatment provided as approved by the reviewing authority. If the soil for 3 feet below the infiltrative layer is very gravelly sand or coarser textured, the trench also must be sand-lined or other treatment as approved by the reviewing authority.
(b) Pressure distribution will be required if more than 500 lineal feet (or 1,000 square feet) of distribution line is needed.
(c) Comparison of soils profile report, percolation rate, and USDA soils report will be used to select applicable square footage.
(d) Square footage is increased because the trench sidewall is not available in EVTA bed systems.
NP – Not permitted

CHAPTER 12
SAND-LINED ABSORPTION TRENCHES

12.1 Design

Trenches must be lined with a minimum of 12 inches of fine to medium sand or loamy sand below the constructed absorption system. For rapid permeability situations, the system is to be sized in accordance with Chapter ~~9~~8 for the soils with percolation rates faster than 3 minutes per inch. For slow permeability situations, the system is to be sized according to the percolation rate of the soils below the trench in accordance with Chapter ~~9~~8. Where systems are placed in soils with a percolation rate faster than 3 minutes per inch and the underlying soil is gravelly sand or very coarse sands, or the depth to a limiting layer ~~seasonally high ground water~~ is less than 6 feet from the bottom of the ~~drain rock~~ trench, the system must be designed using pressure distribution or other treatment provided as approved by the reviewing authority. If pressure distribution is not used, the side walls of the trench must also be sand-lined a minimum of 6 inches to a point 2 inches above the pipe. As an alternative to placing sand on the side walls of the trench, a 24-inch wide trench with gravity distribution may be constructed with the sand placed such that the elevation of the sand at the center of the trench is at least 6 inches lower than the sand at the edge of the trench (i.e., form a V-ditch with the sand). The sand at the center of the trench must still be at least 12 inches in depth.

Reason for Revision:

Footnote (a) in Tables 8-1 and 8-2 currently requires pressure-dosed systems if the soil for three feet below the infiltrative surface contains more than 15 percent gravel. The term “gravel” is general and covers a broad spectrum of soil textures, some of which may not require pressure dosing. For clarification, the term gravel is replaced with “gravelly sand or very coarse sands”. This is consistent with the soil texture associated with a percolation rate of less than three minutes per inch. Further clarification also is added to the footnote to require sand-lined trenches in very gravelly sand or coarser-textured soils. The revised language for pressure dosing is then carried over to section 12.2 for sand-lined absorption trenches so that the requirement for pressure dosing in soils with a percolation rate less than 3 minutes per inch is consistent with the requirements in Tables 8-1 and 8-2.

Proposed Language Revision:

CHAPTER 17
RECIRCULATING TRICKLING FILTERS

17.2.6 The method of recirculation and recirculation rate must be discussed and justified. The liquid capacity of the recirculation tank must be at least 1.5 times the daily design wastewater flow. The recirculation tank must meet the same material and construction specifications as a septic tank. The minimum liquid level in the recirculation tank must be at least 80 percent of the daily flow at all times during the 24-hour daily cycle. The reviewing authority may require systems with large surge flows to have recirculation tanks sized based on the estimated or actual surge flow volume.

Reason for Revision:

With the exception of the filter media, a recirculating trickling filter is nearly identical to a recirculating sand filter from an engineering design perspective. New language is proposed to be added to section 17.2.6 that is identical to the requirements imposed in section 16.2.6 for recirculating sand filters. The reason for the tank to be sized to 1.5 times the daily flow is because it must have sufficient volume to accept the normal daily flow, a portion of the preceding days flow, and still allow for a holding period for biological activity to occur.

Proposed Language Revision:

CHAPTER 20
AEROBIC WASTEWATER TREATMENT UNITS

20.3.4 Advanced treatment (level ~~II~~ 2)

20.3.4. 1 If the aerobic treatment unit is intended to attain a higher level of treatment than a septic tank, the unit must apply for and receive a treatment efficiency classification pursuant to ARM 17.30.718. ~~monitoring data must be submitted from at least three existing systems operating in similar climates and treating wastewater similar in characteristics to that to be treated. Monitoring must include at least six cumulative years of data, with one system being in operation at least three years. Minimum data submitted must include information on time to reach steady state conditions, required maintenance and operation, average daily flow, and influent values for each parameter (if other than residential strength wastewater), and effluent values for each parameter. Sample analysis is to be done by an independent laboratory.~~

CHAPTER 22
EXPERIMENTAL SYSTEMS

22.5 Advance treatment

22.5.1 Unless otherwise addressed by rule for level 2 treatment, ~~I~~if the experimental system is intended to attain a higher level of treatment than a septic tank, monitoring data must be submitted from at least three existing systems operation in similar climates and treating wastewater similar in characteristics to that to be treated. Monitoring must include at least six cumulative years of data, with one system being in operation at least three years. Minimum data submitted must include information on time to reach steady-state conditions, required maintenance and operation, average daily flow, and influent and effluent values for each parameter. Sample analysis is to be done by an independent laboratory.

Reason for Revision:

The requirements in these sections are being replaced by those in a new rule that is currently in the process of adoption by the Board. These revisions are being made in anticipation of amendments to ARM 17.30.702 and new rule ARM 17.30.718 pertaining to the definition of nutrient-reducing subsurface wastewater treatment systems. The amendments to ARM 17.30.702 have been publicly noticed in the Montana Administrative Register (MAR Notice No. 17-206, February 26, 2004, page 387). The proposed amendments to sections 20.3.4.1 and 22.5.1 refer to new rule ARM 17.30.718 concerning nutrient reduction.